Physics 232: Computational Methods of Physics
Syllabus

I.   Catalog Entry

232. **Computational Methods of Physics** , (0-2) Cr. 1. S. Prereq: 222. Techniques in the use of personal computers in physics, including numerical modeling and integration, and the processing of large data sets. Experience in the use of statistical techniques to analyze data and to model physical events. Programming experience is helpful but not necessary.

II.   Introduction

The objective of Physics 232 is to give physics majors and other interested students an overview of computer hardware, application software, and programming languages that will be of use to their future work in research and classwork. There is no text book for the course and most work for the course will be performed during the specified lab period from 2-5 pm on Fridays. There may be some outside reading or homework required, but there will be no exams given.

Here is the plain English version:
If you want to learn how to use Microsoft Office (word processing and spreadsheets) and basic Dos/Windows commands, take ComS 103. If you want to learn programming in a formal class, take ComS 107 (PASCAL), 201 (COBOL), 205 (FORTRAN), or 207/208 (C/C++) or 227/228 (C/C++). There are other classes for numerical analysis and modeling, statistics, and machine-level programming. If you think that you are pretty smart and can figure out all you need to know on your own (with on-line help, a book from the mall, and assistance from an expert one afternoon a week), then you are in the right place.

Therefore, I see the role of Anand and myself more as facilitators than instructors. This is similar to the role of the lab TAs in PHY 221/222 and reflected in the lab status of this class.

How much you learn will depend pretty much on how much time you are willing to invest. Computer literacy is very important for your future employment, but we do not offer a formal series of computer classes in this department, since the requirements are very diverse and depend on the field that you will choose.

Instructors	phone #	Office Hours	e-mail
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III.   Policy on missed labs:

Basically, the policy is the same as for the PHY 221 and 222 labs that most of you are familiar with: **In order to pass this course, you need to complete all the labs successfully.** If you do not complete all labs successfully, you know what happens: You will get an I (incomplete) mark at the end of the semester, which will turn into an F after some time.

If you know that you can't make it to one of our lab sessions (because of severe weather, illness, or some other good reason), please contact Anand and myself (by email would be best) as soon as possible. If this happens, we will discuss with you when you can make up the lab you missed (or are going to miss).

Since this is a small class, we don't need all the formal rules (as in 221 or 222) to find a time for you to make up the labs, but remember: You MUST complete alllabs sucessfully in order to receive a passing grade for this class.

IV.   Course Materials (to be purchased by Jan. 24, 1997)

- There is no required text book for this course. However, it may be benefecial to you to purchase one or more reference books or tutorials that you find useful.
- Composition notebook
- Floppy disks: 3.5 inch, 1.44 MB, double-sided, double density, PC formatted.
- Course packet (available at CopyWorks on the corner of Lincolnway and Welch).

V.   Grades

Grades will be based on several factors:

- A log book of work done in class (to be described below),
- A mid-term project,
- A final project,
- In-class homework.

Each of the above is worth 25% of your final grade. The grade scale will be A = 80-100%, B = 70-79%, C = 60-69%, D = 50-59%, F = below 49%.
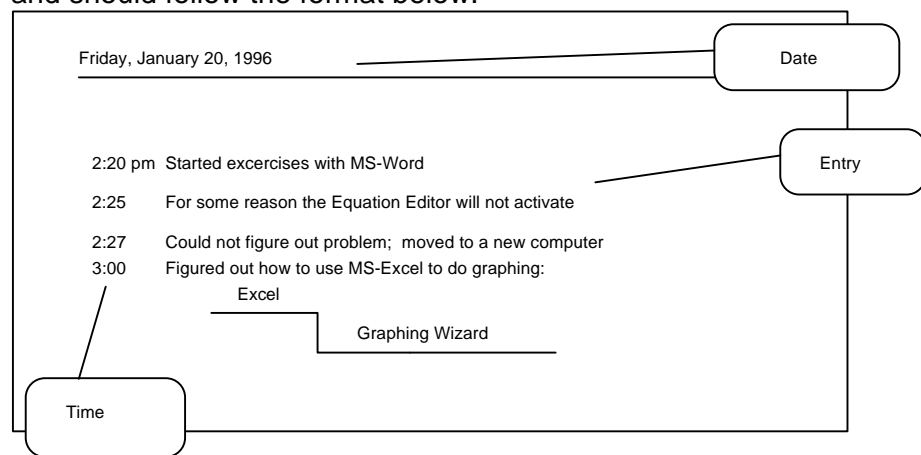Dr. Anand Shastri is the grader for this class.

VI.   Log Book

The log book has several functions:

- To focus your thinking about a problem,
- To serve as a record of how your time is spent,
- To act as a record of problems you faced and how you solved them.

In order to track your thinking on a problem, your log books should include the date and time, and should follow the format below:

The entries should include information on:
- anything new or interesting you have learned,
- problems which occurred,
- solutions you discovered,
- questions that occurred to you.

Your log book should be kept clean. Your entries should be in ink (no pencil), well organized, and clear to read (in print if necessary). Remember: The log book will be used as a basis for grading. If we can't read it, you cannot receive credit for your work.
Your log book will also be your own reference manual throughout this semester.

VII.   Tentative Course Outline

Week #	Date(s)	Topic
1	1/17	Getting Started, hardware, DOS, Windows, PV
2	1/24	The Internet as a Resource for Physics
3-4	1/31, 2/7	MS-Excel (Spreadsheet), Differential Eqs
5-6	2/14,2/21	Maple
7,8	2/28,3/7	FORTRAN or C/C++
	3/14	Spring break, no class
9	3/21	Mid-term Project due
10-11	3/28, 4/4	Computer Interfacing (Hardware)
12	4/11	TBA
13	4/18	TBA
14	4/25	work on final project
finals	5/5	Final project due

VIII.   Course Resources:

Reference desk:	Parks Library Reserve Room and Media Center (CD-ROM)
Newsgroup:	isu.phys.232.
Web site:	http://femto.ssp.ameslab.gov/phy232/index.htm.
Vincent Locker:	% add physics % cd /home/physics/phys232